

What is claimed is:

1 1. A device for thermally affecting tissue of a patient, comprising:
2 a housing, the housing defining an interior volume and being at least
3 partially insertable into an exterior opening in the patient; and
4 a thermal member having a thermal input side and a thermal output side, at
5 least a portion of the thermal member being positioned within the interior volume,
6 one of the thermal input side and the thermal output side being arrangable to
7 provide a temperature different than the other of the thermal input side and the
8 thermal output side, the thermal input side imparting a thermal change to the tissue.

1 2. The device of claim 1, further comprising, a contact member being in
2 thermal communication with the thermal input side of the thermal member and
3 being in thermal communication with the tissue.

1 3. The device of claim 1, further comprising a thermal fluid circulation
2 member, the thermal fluid circulation member provided to circulate thermal fluid
3 across the thermal output side of the thermal member.

1 4. The device according to claim 1, further comprising a surface area
2 expansion element, the surface area expansion element having an interior volume
3 which can be filled with a thermally-transmissive fluid, the thermally-transmissive
4 fluid being in thermal communication with the thermal member.

1 5. The device according to claim 4, wherein the surface area expansion
2 element has a width measured at a widest part and a height measured from a top to
3 a tissue contact area, the width being at least twice the height.

1 6. The device according to claim 5, further comprising a fluid
2 circulation element, the fluid circulation element including a circulation member
3 and a distribution member.

1 7. The device according to claim 6, wherein the circulation member is a
2 pump and the distribution member is at least one injection member.

1 8. The device according to claim 1, wherein the thermal member is
2 configured to directly contact tissue to be treated.

1 9. The device according to claim 2, wherein the contact member is
2 configured to directly contact tissue to be treated.

1 10. The device according to claim 1, further comprising a protective
2 barrier, the protective barrier being disposed on and being in thermal
3 communication with the thermal member.

1 11. The device according to claim 2, further comprising a protective
2 barrier, the protective barrier being disposed on and being in thermal
3 communication with the contact member.

1 12. The device according to claim 2, wherein the contact member
2 includes an access port, the access port being in communication with the tissue.

1 13. The device according to claim 4, wherein the contact member
2 includes an access port, the access port being in communication with the
3 thermally-transmissive fluid.

1 14. The device according to claim 1, further comprising a pressure
2 sensor, the pressure sensor measuring a pressure of the tissue to be treated.

1 15. The device according to claim 1, further comprising a temperature
2 sensor, the temperature sensor measuring a temperature of the tissue to be treated.

1 16. The device of claim 1, further comprising a locator, the locator being
2 operable to move the thermal member relative to the tissue.

1 17. The device according to claim 1, wherein the thermal member
2 removes heat energy from the contact member via the thermal input side and
3 radiates heat energy via the thermal output side.

1 18. The device according to claim 17, wherein the thermal member is a
2 thermocooler.

1 19. The device according to claim 17, further comprising a thermal sink,
2 the thermal sink being in thermal communication with the thermal output side of
3 the thermal member and being operable to radiate heat energy.

1 20. The device according to claim 3, wherein the thermal fluid
2 circulation member is a fan and the thermal fluid is air.

1 21. The device according to claim 3, wherein the thermal fluid
2 circulation member is a pump and the thermal fluid is a liquid.

1 22. The device according to claim 20, wherein the thermal fluid
2 circulation member is a fan and the thermal fluid is air, wherein the fan circulates
3 air across the thermal sink to dissipate heat energy.

1 23. The device of claim 1, wherein the housing is substantially
2 cylindrical in shape.

1 24. The device according to claim 23, wherein the housing includes a
2 distal end portion at least partially insertable into the opening, at least a part of the
3 distal end portion being threaded.

1 25. The device according to claim 1, wherein the housing includes a stop
2 fastener opening and wherein the thermal member is slidable within the housing,
3 and wherein the device further includes a stop fastener insertable into the stop
4 fastener opening, the stop fastener being adjustable to lock the thermal member at
5 a desired position relative to the housing.

1 26. A device for thermally affecting tissue, comprising:
2 a thermal member having a thermal input side and a thermal output side;
3 a thermal cartridge, the thermal cartridge having a cartridge wall defining an
4 interior surface for receiving the thermal member; and
5 an insert housing, the insert housing having an insert wall defining an inner
6 volume configured to slidably receive the thermal cartridge and the insert housing
7 being configured to fit within an opening in a patient.

1 27. The device according to claim 26, further comprising a longitudinal
2 slot attached to the cartridge wall of the thermal cartridge and a longitudinal
3 groove provided in the insert wall of the insert housing, the longitudinal slot
4 configured to slidably engage the longitudinal groove when the thermal cartridge is
5 inserted in the insert housing.

1 28. The device according to claim 22, further comprising a stop fastener
2 provided in communication with the inset housing and the thermal cartridge, the
3 stop fastener is operable to selectively permit the thermal cartridge from sliding
4 within the insert housing.

1 29. The device according to claim 26, further comprising a radial slot
2 attached to the cartridge wall of the thermal cartridge and a radial groove provided
3 in the insert wall of the insert housing, the radial slot configured to slidably engage
4 the radial groove when the thermal cartridge is inserted in the insert housing.

1 30. The device according to claim 26, further comprising a contact
2 member in thermal communication with the thermal input side of the thermal
3 member.

1 31. The device according to claim 30, wherein the contact member has a
2 concave contact surface.

1 32. The device according to claim 26, further comprising a thermal
2 dissipation member in thermal communication with the thermal member.

1 33. The device according to claim 32, further comprising a thermal
2 bridge provided between and in thermal communication with the thermal member
3 and the thermal dissipation member.

1 34. The device according to claim 30, further comprising a thermal
2 bridge provided between and in thermal communication with the thermal member
3 and the contact member.

1 35. A method of affecting a thermal change in a tissue, the method
2 comprising:
3 exposing a tissue of a body to be thermally affected;
4 attaching a thermal device to an anchor point of the body, the thermal
5 device including a thermal member for imparting a thermal change to the tissue;
6 positioning the thermal member proximate to the tissue portion to be
7 thermally affected; and
8 operating the thermal member to thermally change the temperature of the
9 tissue.

1 36. The method of claim 35, wherein the tissue is dura mater and the
2 anchor point is a skull, and wherein exposing the tissue includes creating a burr
3 hole in the skull.

1 37. The method of claim 35, wherein operating the thermal member
2 includes energizing the thermal member to create a temperature differential
3 between a first side of the thermal member and a second side of the thermal
4 member.